Final version of this article published online in Motivation & Emotion, 1-11, 19 February 2017. doi: 10.1007/s11031-017-9602-1

Motivating Emotional Intelligence:

A Reinforcement Sensitivity Theory (RST) Perspective

Alison M. Bacon[1]

&

Philip J. Corr[2]

[1]School of Psychology, Plymouth University, UK

[2]Department of Psychology, City, University of London

Corresponding author:

Dr Alison M. Bacon
School of Psychology
Plymouth University
Drake Circus
Plymouth PL4 8AA
Tel: 01752 584805
Fax: 01752 584808
Email: ambacon@plymouth.ac.uk

Abstract

Trait emotional intelligence (trait EI) is generally associated with positive outcomes and can inform clinical and social interventions. We investigated the sub-factors of trait EI: Wellbeing, Self-control, Emotionality, and Sociability, in the context of the Reinforcement Sensitivity Theory (RST) of motivation. In Study 1, participants (N = 247) completed Carver and White's (1994) BIS/BAS scales and a measure of trait EI. All EI sub-factors were positively associated with BAS Drive and negatively with BIS. Study 2 (N = 382) employed a new questionnaire based on revised RST (Corr & Cooper, 2016). All trait EI factors were positively associated with BAS Goal-Drive Persistence and Reward Interest, and negatively with the BIS. Self-control showed negative associations with BAS Impulsivity and was the only factor not to correlate with BAS Reward Reactivity. Results suggest that high trait EI individuals are goal driven, sensitive to reward and lower in avoidance motivation and negative emotion. This motivational basis to trait EI further explicates its structure.

KEYWORDS: Trait emotional intelligence; revised reinforcement sensitivity theory; motivation; BIS/BAS; RST-PQ; TEIQue

Introduction

Trait emotional intelligence (trait EI) is a constellation of affect-related personality facets reflecting the ability to experience, attend to, identify, understand and utilise personal emotions and those of others (Petrides & Furnham, 2003; Petrides, Pita & Kokkinaki, 2007). Table 1 presents the adult sampling domain of trait EI and illustrates that the construct integrates 15 facets related to affect and social functioning. These facets can further be categorised into four sub-factors: *Wellbeing* (optimism, happiness, self-esteem; high scorers feel content, confident and fulfilled); *Sociability* (emotion management, assertiveness, social awareness; high scorers feel agentic in social contexts and have good interpersonal skills); *Self-control* (emotion regulation, impulsiveness, stress management; high scorers are good at controlling urges and desires, regulating external pressures and handling stress); and *Emotionality* (empathy, emotion perception, emotion expression, relationships; high scorers understand their own and others' feelings and can use this ability in sustaining relationships with others).

It is important to recognise that trait EI as operationalised in this paper comprises a constellation of emotional perceptions assessed via self-report (Petrides, et al., 2007). As such it is distinguishable from ability EI which is measured by maximum performance tests in a similar fashion to intelligence. While ability EI also emphasises managing and understanding emotions, the conceptual differences between the two constructs are reflected in empirical data which has shown very low correlations between measures of trait and ability EI (e.g. O'Connor & Little, 2003; Warwick & Nettelbeck, 2004). Furthermore, while some aspects of trait EI presented in Table 1 may suggest overlap with other well-documented personality traits such as Extraversion or Agreeableness, evidence suggests that trait EI can be identified as distinct in personality factor space showing clear discriminant and incremental validity compared to traits such as the Big Five as well as other emotion-related variables (Andrei,

Siegling, Aloe, Baldaro & Petrides, 2016; Petrides, et al, 2007; Vernon, Villani, Schermer, & Petrides, 2008).

Table 1. The adult sampling domain of trait EI (Petrides et al, 2007; Petrides, 2009)

Sub-factor and related facets	High scorers perceive themselves as…
Wellbeing	
Trait happiness	… cheerful and satisfied with their lives
Trait optimism	… confident and likely to 'look on the bright side' of life
Self-esteem	… successful and self-confident
Self-control	
Emotion regulation	… capable of controlling their emotions
Impulsiveness (low)	… reflective and less likely to give in to their urges
Stress management	… capable of withstanding pressure and regulating stress
Emotionality	
Emotion perception (self and others)	… clear about their own and other people's feelings
Emotion expression	… capable of communicating their feelings to others
Trait empathy	… capable of taking someone else's perspective
Relationships	… capable of having fulfilling personal relationships
Sociability	
Emotion management (others)	… capable of influencing other people's feelings
Assertiveness	… forthright, frank and willing to stand up for their rights
Social awareness	… accomplished networkers with excellent social skills
Adaptability	… flexible and willing to adapt to new conditions
Self-motivation	… driven and unlikely to give up in the face of adversity

Note: Adaptability and Self-motivation are not linked to any one factor but contribute to the global trait EI score

Overall, trait EI encapsulates factors that relate to high levels of prosocial behaviour, achievement and positive emotions and unsurprisingly, therefore, has been shown to have predictive utility across a range of favourable life outcomes, including mental and physical health and Wellbeing (Austin, Saklofske, & Egan, 2005; Martins, Ramalho, & Morin, 2010; Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007), educational achievement and attendance (Petrides, Frederickson, & Furnham, 2004), workplace performance (O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011; Wong & Law, 2002) and quality of social

relationships (Mavroveli, Petrides, Rieffe, & Bakker, 2007). But what motivates these behaviours and achievements? Are individuals with high trait EI just intrinsically motivated towards prosociality or do they experience some excitement at the anticipation of extrinsic reward and recognition? What role do positive emotions play in their motivations and what happens when they encounter a threatening or challenging situation? Given the positive life outcomes associated with high trait EI (and the converse) understanding more about the construct and its underlying mechanisms is of both theoretical and applied interest. However, to date, no research has considered motivational factors in the context of trait EI. This forms the basis of the present two studies. On the face of it, there seems considerable overlap between facets of trait EI as defined above and fundamental personality factors and processes. It would be valuable to explore their statistical commonalities.

Our research is rooted in the assumption that underpinning all major personality traits (including those inherent in trait EI) are basic systems of approach and avoidance motivation (Corr, DeYoung, & McNaughton, 2013). People can approach or avoid potential consequences and it is this tendency to approach and avoid (or do nothing) which manifests as the characteristic patterns of cognition and behaviour which we refer to as personality (Corr, 2015). As detailed by Corr and Krupić (2017), individuals construct their own approach and avoidance related goals and this shapes the nature of the reinforcement they receive. All of this is likely to play an important role in behaviours associated with trait EI.

Given this theoretical orientation, a useful framework for investigating trait EI is the Reinforcement Sensitivity Theory (RST), a prominent neuropsychological theory of personality in terms of emotion, motivation, and learning (see Corr, 2008). In his original conceptualisation, Gray (e.g., 1982, 1987) focussed on two systems that underpin individual differences in personality and psychopathology. The *behavioural approach system* (BAS) was defined as being sensitive to conditioned appetitive stimuli and motivated goal-directed

approach behaviours. Activation of this system was said to lead to the experience of hopeful excitement, drive persistence to reach desired goals, and elation when they have been attained. Conversely, the *behavioural inhibition system* (BIS) was said to be responsive to conditioned aversive stimuli. Its activation was thought to motivate passive avoidance behaviours and contribute to risk assessment and rumination, which can eventuate in the experience of anxiety. In sum, whereas the BAS has been shown to be related to the experience of positive affect, the BIS relates to the experience of negative affect (Corr, 2008).

Revisions to Gray's original concept present a more detailed understanding of these motivational systems. Gray and McNaughton (2000) separated the avoidance mechanism into a Fight-Flight-Freeze System (FFFS), which mediates reactions to *all* aversive stimuli (conditioned or otherwise), leading to avoidance and escape behaviours, and the BIS activated by goal conflict, which occurs when there is equal activation of the FFFS and BAS (or, indeed, goal conflict of any kind with sufficient motivational intensity). As such, Gray and McNaughton characterised the BIS as responsible for detecting and resolving this conflict, rather than being sensitive to punishing stimuli per se. This separation is now widely recognized, in conceptual and psychometrical terms (Corr, 2011; Gray & McNaughton, 2000; Perkins, Kemp, & Corr, 2007; for review, see Corr, 2016; Corr & Cooper, 2016). Most recently the behavioural approach system (BAS) has also been elaborated. This "Let's go for it!" system has the primary function is to move an organism along a spatio-temporal gradient towards a final biological reinforcer. In order to achieve this goal, there are a number of distinct but related BAS processes. "Reward Interest" and "Goal-Drive persistence" that characterize the early stages of approach can be distinguished from "Reward Reactivity" and "Impulsivity" as the final reinforcer is approached and captured (Corr & Cooper, 2016).

In this paper, we present two studies which examine trait EI from the perspective of both the original and revised RST. In Study 1, we employed a widely used psychometric

measure based on unrevised RST that focusses only on the BIS and BAS; while in Study 2, we used a more contemporary and comprehensive psychometric approach that differentiates FFFS and BIS, as well as providing a more nuanced conceptualisation and measurement of the BAS.

Study 1

To date, the most widely used RST personality questionnaire is the Carver and White (1994) BIS/BAS scales. As the name indicates, this well-documented questionnaire measures the sensitivity of the unrevised BIS and BAS (Gray, 1987). The scales yield scores on three BAS factors: *Drive*, related to persistence in pursuing goals; *Reward Responsiveness*, reflecting positive emotional responses to the attainment or anticipation of reward; and *Fun-Seeking*, related to the desire for new rewards and a willingness to approach a potentially rewarding event on the spur of the moment. A BIS score is also produced reflecting sensitivity to aversive stimuli and tendency towards avoidant behaviours.

Individuals high in trait EI tend to experience positive affect (trait happiness and optimism), possess robust self-esteem, and have the ability to cope effectively with stress. Higher trait EI scores have accordingly been associated with less rumination on negative events and frequent use of adaptive, and infrequent use of maladaptive, coping strategies (Petrides, et al., 2007). This suggests that high trait EI individuals are likely to deal positively with life challenges rather than withdrawing from them. Hence, we predicted that they would score higher on the BAS scales, reflecting a positive approach goal orientation, and present low scores on the BIS. Given the paucity of extant literature on the associations between trait EI and motivation, we made no further predictions at this stage.

Method

Participants

Two hundred and forty-seven undergraduate students participated in return for course credit: 129 females (M^{age} = 20.08, SD = 1.60) and 118 males (M^{age} = 20.31, *SD* = 2.32; *t* (245) = .90, *p* > .50).

Materials and Procedures

All participants completed the following measures:

Trait Emotional Intelligence Questionnaire – short form (TEIQue-SF; Petrides, 2009; Petrides & Furnham, 2006). This 30-item questionnaire has been found to provide near identical estimates of the full-scale TEIQue (Petrides, 2009). A recent item response theory analysis confirmed its good psychometric properties at the item and global level and it is a recommended measurement tool when a rapid assessment of trait EI is required (Cooper & Petrides, 2010). It is also considered a robust measure with student samples (Sánchez-Ruiz, Pérez-González, & Petrides, 2010). Items such as "*Expressing my emotions with words is not a problem for me*" and "*I usually find it difficult to regulate my emotions*" are responded to on a 7-point Likert scale where a score of 1 = 'completely disagree' and 7 = 'completely agree', giving a possible maximum summed global score of 210. The TEIQue-SF was originally constructed to yield this single global score, however the developer has recently released an online scoring engine which allows for the calculation of separate scores for the four sub-factors of trait EI and their respective reliability statistics (Petrides, 2016). The actual scoring algorithm is not in the public domain, but we obtained sub-factor scores automatically by inputting raw item level data into the engine. These scores are obtained by calculating the mean across relevant items, hence the maximum possible for each subscale is

7. Each sub-factor showed adequate reliability with the present sample: *Wellbeing* α = .81. *Self-control* α = .76, *Emotionality* α = .67, *Sociability* α = .68, *full scale* α = .86.

BIS/BAS scales (Carver & White, 1994). This measure consists of 20 items, to which participants respond on a 4-point scale ranging from "1 = strongly disagree" to "4 = strongly agree". Seven items yield a score on BIS and focus on potentially punishing events and how participants respond to them (e.g., *"If I think something unpleasant is going to happen, I usually get pretty worked up"*). Thirteen items assess three conceptions of BAS. The BAS *Reward Responsiveness* subscale emphasizes sensitivity to reward (e.g., "*When I get something, I want I feel excited and energized"*), the BAS *Drive* subscale taps pursuit of appetitive goals (e.g., "*I go out of my way to get things I want"*); and the BAS Fun-Seeking subscale captures the tendency to search for novel, potentially rewarding experiences (e.g., "*I often act on the spur of the moment"*). The scales showed good reliability in the present sample (BAS Drive α = .85, Reward Responsiveness α = .79, Fun-Seeking α = .91; BIS α = .85).

Results and Discussion

Table 2 shows partial Pearson product moment correlations between measures, controlling for sex. Here we can see that trait EI overall score was significantly positively correlated with BAS Drive, but negatively with BIS. The Wellbeing sub-factor also presented this pattern. Self-control was significantly correlated with all four of the BIS-BAS scales, positively with BAS Drive and Fun-Seeking, and negatively with Reward Responsiveness and BIS. Emotionality and Sociability present a negative association with BIS only.

Table 2. Partial correlations (controlling for sex) between trait EI and RST variables for Study 1.

	Wellbeing	Self-control	Emotionality	Sociability	BAS Drive	BAS Fun-Seeking	BAS Reward Responsiveness	BIS
Trait EI total	.78**	.75**	.68**	.75**	.26**	.10	-.09	-.31**
Wellbeing		.50**	.30**	.51**	.14**	.01	-.05	-.28**
Self-control			.37**	.42**	.36**	.18*	-.26**	-.23**
Emotionality				.38**	.11	-.02	.04	-.15*
Sociability					.02	.02	.07	-.30**
BAS Drive						.33**	-.11	.12
BAS Fun Seeking							-.17*	.16*
BAS Reward Responsiveness								-.10

* $p < .05$

** $p < .001$

Regression analyses were conducted on each of the four trait EI factors to examine how much variance they share with the BIS-BAS variables. In each case, sex was included as a control variable. The results are shown in the top section of Table 3. Overall, these results were very much in line with our predictions. We expected high trait EI individuals to have a positive and resilient outlook and our data confirmed this – higher scorers were characterised as being goal-driven (BAS Drive) and experiencing lower levels of negative feelings, such as fear, frustration or sadness (BIS). Considering the sub-factors individually, Self-control shares by far the most variance with the RST variables. An individual who scores highly on this aspect of trait EI is likely to be able to regulate their emotions and behaviours effectively and focus on achieving their goals. They are responsive to the prospect of reward for their efforts but are not impulsive in their actions to obtain that reward. This profile is supported by the pattern of significant effects observed in the regression on Self-control. The other three sub-factors can arguably be said to comprise aspects of trait EI which are positive in terms of attitude, affect and relationships with others, therefore contributing to the established link between high trait EI and favourable life outcomes. However, these more interpersonal and emotional factors may not be as closely involved with goal-related motivational behaviours as is Self-control and showed no shared variance with any of the BAS scales.

Finally, it is notable that high trait EI individuals do not seem to be particularly motivated by the Fun-Seeking aspect of the BAS with the only significant association being a moderate positive correlation with Self-control. Previous research has shown that Fun Seeking is correlated positively and substantially with trait Sensation Seeking, the tendency to take risks for the sake of novel and exciting experiences (Zuckerman, 2007) and some studies have suggested that sensation seeking and global trait EI scores are inversely related (Bacon et al., 2014). Furthermore, Fun-Seeking has been related to frustration,

Table 3. Regression models on the four trait EI sub-factors, for both studies

	Wellbeing			Self-control			Emotionality			Sociability		
	St. β	t	p	St. β	t	p	St. β	t	p	St. β	t	p
Study 1												
Sex	-.14	-2.22	.03	.27	5.02	< .001	.03	.44	.66	.12	1.88	.06
BAS Drive	.17	2.62	.01	.32	5.86	< .001	.15	2.22	.03	.16	2.48	.01
BAS Reward Responsivity	-.06	-.21	.83	-.23	-4.32	< .001	.03	.52	.61	.06	1.05	.30
BAS Fun-Seeking	-.01	-.98	.33	.07	1.26	.21	-.04	-.61	.54	.03	.44	.66
BIS	-.30	-4.83	< .001	-.29	-5.50	< .001	-.16	-2.49	.01	-.32	-5.15	< .001
	Adj. R^2 = .10			Adj. R^2 = .35			Adj. R^2 = .03			Adj. R^2 = .13		
Study 2												
Sex	-.07	-1.63	.11	.07	1.71	.09	-.19	-3.89	< .001	-.002	-.04	.97
BAS Reward Interest	.04	.83	.41	.15	3.10	.01	.01	.24	.81	-.07	-1.23	.22
BAS Goal-Drive Persistence	.28	3.85	< .001	.18	3.89	< .001	.18	3.24	.001	.12	2.25	.03
BAS Reward Reactivity	.36	6.91	< .001	.08	1.36	.74	.17	2.78	.006	.16	2.66	.01
BAS Impulsivity	-.09	-1.85	.07	-.22	-5.02	< .001	-.12	-2.18	.03	.17	3.15	.002
BIS	-.43	-9.54	< .001	-.46	-10.58	< .001	-.33	-6.28	< .001	-.37	-7.04	< .001
FFFS	-.01	-.24	.81	-.15	-3.34	.001	.01	.17	.86	-.13	-2.42	.02
	Adj. R^2 = .41			Adj. R^2 = .47			Adj. R^2 = .22			Adj. R^2 = .22		

discouragement and sadness following non-reward (Carver, 2004), emotions not typically associated with high trait EI. Low impulsivity is a key component of emotional intelligence (Petrides, et al, 2007) and this is likely to explain why trait EI and BAS Fun-Seeking are minimally related in Study 1, with the latter reflecting a rash impulsive side to BAS, rather than sensitivity to reward or drive persistence (Corr, et. al., 2013). It is also worth noting that Self-control presented a negative association with reward responsiveness. This seems surprising if we interpret the positive correlation with Fun-Seeking in terms of high impulsivity. Corr et al. (2013) suggested that when the approached goal is close to realisation and the final reward close to capture, fast, impulsive action may be more appropriate than planning as over control of BAS-driven impulses can lead to lost opportunities. However, it may be that individual particularly high in Self-control keep their emotions in check until the goal is secured. Overall, our data support the suggestion that BAS is a complex multidimensional system and, as Carver (2005) has discussed, the BAS scales integrate sensitivity to reward with impulsiveness in action and these functions can be in conflict. Indeed, the complexity of the original BIS-BAS conceptualisation and the need to capture conflicting functions was one of the factors which led to revised RST. In Study 2 we explore the trait EI sub-factors further using the most recently developed revised RST measure.

Study 2

Given that this was the first research to investigate trait EI in terms of approach – avoidance motivational systems, we conducted Study 1 using what is the most well-documented and widely-used measure to date. However, while we were able to gain some new insights into the association between trait EI and motivated behaviour, these results do not take into account significant recent developments to RST. Firstly, Carver and White's (1994) BIS/BAS scales do not contain an explicit measure of the Fight-Flight-Freeze system

(FFFS) although one can be derived, albeit in a rather inadequate manner (Corr, 2016). As such, in common with the majority of other studies adopting this measure, we did not differentiate the FFFS from the BIS. Given Gray and McNaughton's (2000) differentiation between the roles of FFFS as an avoidance/escape mechanism and the BIS as a conflict detection one, the negative association between BIS and trait EI observed in Study 1 may not be a straightforward reflection of low anxiety in high trait EI individuals, but it may also encompass a tendency not to engage in avoidance/escape behaviour (which we might expect). Secondly, as mentioned previously, Corr and Cooper's (2016) most recent elaborations of the BAS system presents a more nuanced understanding of the sub-components of this system and, therefore, may tell us more about the relationship between trait EI and approach motivations than was achieved in Study 1. For these reasons, we repeated Study 1 but used the most recent psychometric measure of revised RST (rRST), the Reinforcement Sensitivity Theory of Personality Questionnaire (RST-PQ: Corr & Cooper, 2016). It contains distinct measures of FFFS and BIS, and has four separate BAS scales: Reward Interest, Goal-Drive Persistence, Reward Reactivity, and Impulsivity.

Given the results of Study 1, and on the theoretical basis of the RST-PQ, we made a number of predictions. First, we expected trait EI would share variance with BAS Goal-Drive Persistence. Secondly, as trait EI has been positively associated with the Big Five trait Openness to Experience (Vernon, Villani, Schermer, & Petrides, 2008), we further expected an association with BAS Reward Interest, which reflects a liking for novel experiences and the ability to identify and take advantage of new opportunities. In terms of Reward Reactivity, Corr and Cooper (2016) reported positive correlations between this and Carver and White's BAS scales and also with measures of the Big Five trait Extraversion. As Extraversion reflects drive and a tendency to experience positive emotions (Lucas, Le, & Dyrenforth, 2008), and has previously been associated with trait EI (Vernon et al., 2008), we

predicted that high trait EI individuals would also have higher Reward Reactivity. Finally, in line with Study 1, we predicted negative associations between trait EI and BAS impulsivity and BIS scores. The relationship between trait EI and FFFS scores was expected to be weaker, or negative, reflecting the more immediate defensive nature of this system which is likely to be more prevalent in those with lower levels of trait EI. In terms of the four sub-factors of trait EI, given the results of Study 1, together with the findings of Andrei et al.'s (2016) review that much of the effect of trait EI on non-affective variables can be attributed to the intrapersonal factors Self-control and Wellbeing, we expected to observe all the above predicted effects for individuals high in Self-control. We also proposed that the results for Self-control in Study 1 may represent a conflict whereby behavioural and emotional restraint conflict with an urge to capture the final goal/reward. The new conceptualisation of BIS as conflict resolution mechanism suggests that we may observe a positive relationship between this and Self-control if our assumption is correct. A negative correlation on the other hand would suggest lower levels of conflict. Wellbeing is also an intrapersonal system according to Andrei et al. (2016) and although this shared relatively little variance with the BIS-BAS systems in Study 1 the more nuanced measurements of RST used in Study 2 may be more explanatory. Finally, we expected weaker or non-significant effects for sub-factors Emotionality and Sociability which are more interpersonal in nature (Andrei et al, 2016) and which showed little association with BIS-BAS variables in Study 1.

Method

Participants

Of a total of 382 participants, 166 were undergraduate students who took part in return for course credit (134 female). None had taken part in Study 1. The remaining 216 participants (118 female) were recruited from an established online research participation

website and paid £3 for their time. All self-declared as being educated to at least UK *A'* level standard placing them at a similar educational level to the undergraduates. The two groups differed significantly in age: students M = 19.93, SD = 1.63, non-students M = 31.98, SD = 8.25, t (380) = 18.55, $p < .001$. The overall sample comprised 252 females, M_{age} = 20.00, SD = 1.53; and 130 males M_{age} = 20.44, SD = 2.38; p = .11)

Materials and Procedures:

All participants completed the following measures in the order below via an online link hosted by SurveyMonkey.co.uk.

TEIQue-SF (Petrides, 2009; Petrides & Furnham, 2006) as described previously. The scale showed good internal consistency: full scale α = .91, Wellbeing α = .87, Self-control α = .76, Emotionality α = 73, Sociability α = .78.

Reinforcement Sensitivity Theory of Personality Questionnaire (RST-PQ, Corr & Cooper, 2016). This 65-item measures three major systems: Fight/Flight/Fear System (FFFS; e.g., "*I am the sort of person who easily freezes-up when scared*"); Behavioural Inhibition System (BIS; e.g., "*When trying to make a decision, I find myself constantly chewing it over*"); and four Behavioural Approach System (BAS) factors: Reward Interest (e.g., "*I regularly try new activities just to see if I enjoy them*"); Goal-Drive Persistence (e.g., "*I am very persistent in achieving my goals*"); Reward Reactivity (e.g., "*I get a special thrill when I am praised for something I've done well*"); and impulsivity (e.g., "*I find myself doing things on the spur of the moment*"). Participants respond on a scale from 1 (not at all) to 5 (highly). The RST-PQ scales presented good internal reliability with the present sample: FFFS = .81; BIS = .94; BAS Reward Interest =. 79; BAS Goal-Drive Persistence = .86; BAS Reward Reactivity = .83; BAS Impulsivity = .78.

Results

Table 4 shows partial correlations between measures, controlling for sex. Given that we had a sample drawn from two disparate populations (student and non-student) we computed correlations separately for the two groups and, then, for the overall sample, with virtually identical results. As such we present analysis based on the overall sample (N = 382). In line with our prediction and with Study 1, trait EI overall was significantly and positively associated with BAS Goal-Drive Persistence, Reward Interest and Reward Reactivity, but not Impulsivity. Also as in Study 1, trait EI showed a significant negative association with BIS, as well as with FFFS.

Self-control presented positive significant relationships with BAS Reward Interest and Goal-Drive Persistence, but not Reward Reactivity. It showed negative associations with Impulsivity, BIS and FFFS. Both Wellbeing and Emotionality presented significant positive associations with Reward Interest, Goal-Drive Persistence and Reward Reactivity, and a negative one with BIS. Sociability showed more moderate though significant positive correlations with all BAS scales and negative ones with BIS and FFFS. Multiple regression analyses were conducted as in Study 1 and the results are presented in the lower half of Table 3. As this shows, the revised RST factors accounted for about twice the variance in the intrapersonal trait EI sub-factors Self-control and Wellbeing, compared to the interpersonal sub-factors, Emotionality and Sociability, in line with our predictions.

Table 4. Partial correlations (controlling for sex) between trait EI and RST variables for Study 2.

	Wellbeing	Self-control	Emotionality	Sociability	BAS Reward Interest	BAS Goal-Drive Persistence	BAS Reward Reactivity	BAS Impulsivity	BIS	FFFS
Trait EI total	.80**	.74**	.80**	.76**	.35**	.39**	.29**	-.01	-.56**	-.21**
Wellbeing		.55**	.49**	.44**	.34**	.37**	.39**	.04	-.45**	-.09
Self-control			.43**	.41**	.22**	.28**	.03	-.20**	-.59**	-.32**
Emotionality				.55**	.20**	.27**	.18**	-.07	-.35**	-.08
Sociability					.17*	.19**	.20**	.16*	-.38**	-.21**
BAS Reward Interest						.51**	.47**	.31**	-.15*	.02
BAS Goal-Drive Persistence							.43**	.15*	-.06	.10
BAS Reward Reactivity								.44**	.06	.27**
BAS Impulsivity									.17*	.10
BIS										.43**

* $p < .05$

** $p < .001$

General Discussion

These two studies present the first investigation into the relationship between approach –avoidance motivational systems and trait Emotional Intelligence (trait EI). Our aim was to understand more about how emotionally intelligent behaviour is motivated by examining the construct in terms of the reinforcement sensitivity theory (RST) of personality. Our results, overall, indicate a robust positive approach motivational bias in trait EI with higher levels consistently associated with goal-drive motivators and those sensitive to reward. Conversely, trait EI also presents a consistently strong negative association with the BIS. The revised RST definition of BIS suggests that it is activated in the presence of significant goal conflict (e.g., when FFFS and BAS are in opposition). It would seem that low trait EI people approach their goals and rewards with some trepidation, defined as *defensive approach* behaviour - caution in a potentially rewarding environment; whereas, in contrast, high EI experience less motivational conflict (Corr, 2008). Revised RST also contends that approach-approach and avoidance-avoidance (i.e. a choice between equally appealing or equally aversive options) conflicts also involve activation of the BIS, as do novel experiences which may seem attractive but where we are unsure what to expect (Corr, 2008). Evidence has suggested a preference for familiarity (rather than novelty) in high BIS individuals (Quilty, Oakman, & Farolden, 2007) and as trait EI tends to support an approach towards potentially rewarding novel situations this may offer a further explanation for its negative relationship with BIS.

In both studies, we examined trait EI in more detail in terms of its four sub-factors. Self-control and Wellbeing have been conceptualised as intrapersonal and accounting for the most incremental variance in their association with other personality variables (Andrei, et. al., 2016). Our Study 1 suggested this was the case with Self-control and the BIS-BAS scales.

Study 2 supported the suggestion for both Self-control and Wellbeing, with the RST-PQ. Self-control presents some of the most interesting data in terms of motivation, In Study 1, Self-control presents a significant positive association BAS drive and fun-seeking but significant negative ones with BAS reward responsiveness and BIS. In Study 2 however, while Self-control was positively associated with BAS goal drive persistence and reward interest and negatively with BIS and FFFS (all very much in line with the results of the first study), it also showed a negative relationship with BAS impulsivity. One of the key questions following Study 1 concerned Self-control and its seemingly conflicting relationship with fun-seeking and BIS, given that in terms of Carver and White's BIS-BAS scales, the former is assumed to reflect positive affect and impulsivity and the latter negative affect and avoidance behaviour. It shows a negative association with BIS in both studies. In revised RST however, we consider BIS to represent a conflict detection system, rather than simply a representation of anxiety and fear. Activation of the BIS entails the inhibition of prepotent conflicting behaviours, the engagement of risk assessment processes, and the scanning of memory and the environment to help resolve concurrent conflict. This allows the individual to assess whether to approach a potentially unpleasant situation (albeit cautiously) or to avoid it. BIS activation can lead to worry, rumination and ultimately behavioural disengagement, especially when the threat is unavoidable. Study 2 therefore offers some incremental explanation as to the motivated nature of Self-control. The negative relationship between high Self-control and BIS in Study 1 is likely to represent low conflict detection, rather than fear – that is, people with high self-control are better able to mitigate the negative consequences (e.g., passive avoidance and rumination) of BIS activation, or, indeed, they may experience a lower level of BIS activation in the first place. BIS was negatively and significantly correlated with Self-control (indeed with all four trait EI sub-factors) which suggests that higher levels of goal-conflict are most typical in low trait EI individuals. In

contrast, FFFS correlations were inconsistent, negligible for Wellbeing and Emotionality and negative and significant with Socialability and Self-control (i.e. individuals scoring highly in the latter two aspects of trait EI are least fearful and less predisposed to avoidance style responding).

Self-controlled participants also presented a negative relationship with Reward Reactivity (Study 2) and Reward Responsivity (Study 1) and although higher scores were positively associated with BAS Fun-Seeking in Study 1, they shared negative variance with BAS Impulsivity in Study 2. Revised RST considers a primary function of the BAS is to move the individual up a temporal gradient, from a start state, toward the final biological reinforcer (Corr & Cooper, 2016). It would seem that the more Self-controlled individual feels eagerness at the start of this process (reward interest) and is driven to achieve (goal drive), but may not allow themselves to feel excitement (reward reactivity) or to behave in an attendant impulsive manner when the final reinforcer is within reach. High Wellbeing individuals are also driven to achieve and receptive to potential reward for their achievements. The main difference between Wellbeing and Self-control is reward reactivity - those high in Wellbeing are excited by the prospect of imminent reward and may constrain their behaviour but not their feelings.

To return to the questions we posed at the outset regarding the motivation of emotionally intelligent behaviours, if we accept the RST stance that personality is underpinned by basic motivators, our results suggest that the behaviours and emotions which typify higher levels of trait EI are driven by a wish to achieve personal goals. These are presumably prosocial in nature given the established relationship between high trait EI and behaviour which is supportive and compassionate towards others. But does this reflect pure altruism? Our results further suggest that high trait EI individuals are motivated by a desire for reward and recognition and (with the exception of the most highly Self-controlled)

experience a thrill when these are forthcoming (i.e., "reward reactivity"). Trait EI is known to encompass high levels of self-esteem, optimism and happiness, so it is unlikely that rewards are a necessary mood enhancer or ego-boost for many of these individuals, and it may be that the "feel-good" feelings inherent in prosocial behaviours account for these results. These may then iteratively reinforce self-esteem, optimism and positive affect. Furthermore, when high trait EI individuals encounter a threatening or challenging situation, they appear to experience less anxiety, fear or emotional conflict than do those with lower emotional intelligence. It is possible that their enhanced inter - and intra-personal awareness facilitates effective management of such situations, allowing them to achieve their goal or, conversely, recognise and accept when it is no longer worth pursuing.

Our results also present converging evidence in support of recent research which has taken an evolutionary approach to the investigation of revised RST. Krupić, Gračanin and Corr (2016) indicated that Reward Interest related to a tendency to explore one's environment, participate in competitions that signal physical ascendancy and in reciprocative caring for others. Reward Reactivity is important in social affiliation, Extraversion and Social Closeness. The present results are in line with the suggestion that individuals that score high on Reward Interest and Reactivity show a tendency to act prosocially, or to contribute to society, and indicate how trait EI can contribute to evolutionarily adaptive social behaviours. In this context however, it is worth noting the evidence suggesting that trait EI may have a darker side, reflected in behaviour which is more selfish than altruistic, even if it does not always appear to be on the surface. Successful social manipulation is necessarily based on good emotional understanding (Björkqvist, 1994; Jones & Paulhus, 2011) and some females high in trait EI have been found to use their abilities to facilitate Machiavellian behaviours in pursuit of instrumental and relationship goals (Bacon et al, 2014). Research has showed also that some males show a similar association between high trait EI and inauthentic social

behaviours (e.g., claiming to feel or like something when you do not; Bacon & Regan, 2016). While such findings may seem at odds with the concept of trait EI, we can imagine how for some individuals, especially in difficult situations, such outwardly antisocial behaviours can seem to be adaptive and a way to achieve social or material goals and rewards. In evolutionary terms, this may have been a way for the less well-endowed in society to survive, retain a mate and hence reproduce (Paquette, 2014).

The present study is not without limitations, primarily those inherently associated with self-report. Nevertheless, while Study 1 used student participants our sample for Study 2 was extended to a wider general population and included a variety of ages. That results were consistent across the two studies (differences in RST scale notwithstanding) suggests a good degree of validity in our findings, and that they extend beyond student populations. As the studies used different samples we cannot definitively state that the RST-PQ has clear incremental validity over the BIS-BAS scales; however, Study 2 did explain considerably more variance in trait EI compared to Study 1 so there is some preliminary evidence in that direction and further research may wish to test the question more directly. In addition, for these first studies into motivating trait EI we have used purely psychometric measures. While this is an established and well regarded way of exploring individual differences, future research might usefully consider incorporating behavioural measures as well. Moreover, as Corr and Cooper (2016) suggested, a neuropsychological investigation, for instance by non-invasive EEG, would also be informative. Finally, it could be argued that some aspects of trait EI are broadly similar to other personality constructs – for instance Sociability and Extraversion, and that this should be controlled for. However, despite some overlap, trait EI has consistently been shown to possess significant incremental validity compared to traits encapsulated within personality models such as the Big Five (Petrides, et al, 2007; Vernon, Villani, Schermer, & Petrides, 2008).

In conclusion, this first investigation into the motivation of emotionally intelligent behaviour presents an advance in both trait EI and RST research, presenting insight into motivational systems which underpin the prosocial behaviours inherent in trait EI. These studies show that high trait EI is typified by approach motivational tendencies and these encompass elements of determination in achieving goals and sensitivity to reward. Higher trait EI is associated with lower BIS scores, associated with goal-conflict, anxiety, worry and rumination. Greater understanding of trait EI also allows for further insight into drivers behind the range of positive outcomes which are associated with it. Motivators could potentially be focus for interventions aimed at enhancing life chances and stimulating behaviour change.

Compliance with Ethical Standards

Funding: There is no funding to report for this research.

Conflict of Interest: Neither author have any conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants in the study.

References

Andrei, F., Siegling, A.B., Aloe, A.M., Baldaro, B., & Petrides, K.V. (2016). The incremental validity of the Trait Emotional Intelligence Questionnaire (TEIQue): A systematic review and meta-Analysis. *Journal of Personality Assessment, 98*, 261-276. doi: 10.1080/00223891.2015.1084630

Austin, E. J., Saklofske, D. H., & Egan, V. (2005). Personality, well-being and health correlates of trait emotional intelligence. *Personality and Individual Differences, 38(3),* 547–558. doi: 10.1016/j.paid.2004.05.009

Bacon, A. M., Burak, H., & Rann, J. (2014). Sex differences in the relationship between sensation seeking, trait emotional intelligence and delinquent behaviour. *The Journal of Forensic Psychiatry & Psychology, 25*, 673-683. doi: 10.1080/14789949.2014.943796

Bacon, A. M. & Regan L. (2016). Manipulative relational behaviour and delinquency: Sex differences and links with emotional intelligence. *The Journal of Forensic Psychiatry & Psychology, 27(3),* 331-348. doi: 10.1080/14789949.2015.1134625

Bhullar, N., Schutte, N. S., & Malouff, J.M. (2012). Associations of individualistic-collectivistic orientations with emotional intelligence, mental health, and satisfaction with life: A tale of two countries. *Individual Differences Research 10(3),* 165-175.

Björkqvist, K. (1994). Sex differences in physical, verbal, and indirect aggression: A review of recent research. *Sex Roles*, 30(3-4), 177–188. doi: 10.1007/BF01420988

Carver, C. S. (2003). Pleasure as a sign you can attend to something else: Placing positive feelings within a general model of affect. *Cognition and Emotion, 17*, 241–261. doi: 10.1080/02699930302294

Carver, C. S. (2004). Negative affects deriving from the Behavioral Approach System. *Emotion, 4(1),* 3–22. doi: 10.1037/1528-3542.4.1.3

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology, 67*, 319-333. doi: 10.1037/0022-3514.67.2.319

Cooper, A., & Petrides, K.V. (2010). A psychometric analysis of the Trait Emotional Intelligence Questionnaire–Short Form (trait EIQue–SF) using item response theory. *Journal of Personality Assessment, 92(5),* 449–457. doi: 10.1080/00223891.2010.497426

Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience and Biobehavioral Reviews, 28*, 317-332. doi: 10.1016/j.neubiorev.2004.01.005

Corr, P. J. (2008). Reinforcement sensitivity theory (RST): Introduction. In P. J. Corr (Ed.), *The Reinforcement Sensitivity Theory of Personality* (pp. 1-43). Cambridge: Cambridge University Press.

Corr, P. J. (2011). Anxiety: Splitting the phenomenological atom. *Personality and Individual Differences (Special Issue: Anxiety), 50*, 889-897. doi: 10.1016/j.paid.2010.09.013

Corr, P. J. (2015). Approach, avoidance, and their conflict. In J. Wright (Ed.), *International Encyclopedia of Social and Behavioral Sciences*. Oxford: Elsevier.

Corr, P. J. (2016). Reinforcement sensitivity theory of personality questionnaires: Structural survey with recommendations. *Personality and Individual Differences*, *89*, 60-64. doi: 10.1016/j.paid.2015.09.045

Corr, P. J., DeYoung, C. G., & McNaughton, N. (2013). Motivation and personality: A neuropsychological perspective. *Social and Personality Psychology Compass*, *7*, 158-175. doi: 10.1111/spc3.12016

Corr, P. J., & Cooper, A. (2016). The Reinforcement Sensitivity Theory of Personality Questionnaire (RST-PQ): Development and validation. *Psychological Assessment*, *28*, 1427-1440. doi: 10.1037/pas0000273

Corr, P. J., & Krupić, D. (2017). Motivating personality: Approach, avoidance, and their conflict. In A. Elliott (Ed.). *Advances in Motivation Science*. Elsevier.

Gray, J. A. (1982). *The Neuropsychology of Anxiety: An Enquiry into the Functions of the Septo-hippocampal System*. Oxford, UK: Oxford University Press.

Gray, J. A. (1987). *The Psychology of Fear and Stress.* Cambridge: Cambridge University Press.

Gray, J. A., & McNaughton, N. (2000). *The Neuropsychology of Anxiety: An Enquiry into the Functions of the Septo-hippocampal System (2nd ed.)*. Oxford: Oxford University Press.

Jones, D. N., & Paulhus, D. L. (2011). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences, 51,* 679–682. doi: 10.1016/j.paid.2011.04.011

Krupić, D., Gračanin, A., & Corr, P.,J. (2016). The evolution of the Behavioural Approach System (BAS): Cooperative and competitive resource acquisition strategies. *Personality and Individual Differences, 94,* 223–227. doi: 10.1016/j.paid.2016.01.044

Lucas, R.E., Le, K., & Dyrenforth, P.S. (2008). Explaining the extraversion/positive affect relation: Sociability cannot account for extraverts' greater happiness. *Journal of Personality, 76,* 385–414. doi: 10.1111/j.1467-6494.2008.00490.x

Martins, M., Ramalho, N., & Morin, E. (2010). A comprehensive meta-analysis of the relationship between Emotional Intelligence and health. *Personality and Individual Differences, 49,* 554–564. doi: 10.1016/j.paid.2010.05.029

Mavroveli, S., Petrides, K.V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being and peer-rated social competence in adolescence. *British Journal of Developmental Psychology, 25,* 263–275. doi: 10.1348/026151006X118577

O'Boyle, E. H., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior, 32,* 788–818. doi: 10.1002/job.714

O'Connor, R. M., & Little, I. S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35*, 1893–1902. doi: 10.1016/S0191-8869(03)00038-2

Paquette, D. (2014). An evolutionary perspective on antisocial behavior: Evolution as a foundation for criminological theories. In J. Morizot & L. Kazemian (Eds.) *The development of criminal and antisocial behavior* (pp. 315 – 330). New York: Springer.

Perkins, A. M., Kemp, S. E., & Corr, P. J. (2007). Fear and anxiety as separable emotions: An investigation of the revised reinforcement sensitivity theory of personality. *Emotion, 7*, 252–261. doi: 10.1037/1528-3542.7.2.252

Petrides, K. V. (2009). *Technical Manual for the Trait Emotional Intelligence Questionnaires* (trait EIQue). London: London Psychometric Laboratory.

Petrides, K.V. (2016). Trait EIQue scoring engine. Accessed 02/01/2017 from http://www.psychometriclab.com/

Petrides, K. V., & Furnham, A. (2003). Trait emotional intelligence: Behavioural validation in two studies of emotion recognition and reactivity to mood induction. *European Journal of Personality, 17*, 39-57. doi: 10.1002/per.466

Petrides, K.V., & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organizational variables. *Journal of Applied Social Psychology, 36*, 552–569. doi: 10.1111/j.0021-9029.2006.00019.x

Petrides, K.V., Frederickson, N., & Furnham, A. (2004). The role of trait emotional intelligence in academic performance and deviant behavior at school. *Personality and Individual Differences, 36*, 277–293. doi: 10.1016/S0191-8869(03)00084-9

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology, 98*, 273-289. doi: 10.1348/000712606X120618

Petrides, K. V., Mikolajczak, M., Mavroveli, S., Sánchez-Ruiz, M-J., Furnham, A., & Pérez-González, J-C. (2016). Recent developments in trait emotional intelligence research. *Emotion Review, 8*, 335-341. doi: 10.1177/1754073916650493

Quilty, L. C., Oakman, J. M., & Farolden, P. (2007). Behavioural inhibition, behavioural activation, and the preference for familiarity. *Personality and Individual Differences 42*, 291–303. doi: 10.1016/j.paid.2006.07.007

Sánchez-Ruiz, M.J., Pérez-González, J.C., & Petrides, K.V. (2010). Trait emotional intelligence profiles of students from different university faculties. *Australian Journal of Psychology, 62*, 51–57. doi: 10.1080/00049530903312907

Schutte, N. S., Malouff, J. M., Thorsteinsson, E. B., Bhullar, N., & Rooke, S. R. (2007). A meta-analytic investigation of the relationship between emotional intelligence and health. *Personality and Individual Differences, 42*, 921–933. doi: 10.1016/j.paid.2006.09.003

Vernon, P. A., Villani, V. C., Schermer, J. A., & Petrides, K. V. (2008). Phenotypic and genetic associations between the Big Five and trait emotional intelligence. *Twin Research and Human Genetics, 11*, 524-530. doi: 10.1375/twin.11.5.524

Warwick, J., & Nettelbeck, T. (2004). Emotional intelligence is … ? *Personality and Individual Differences, 37*, 1091–1100. doi: 10.1016/j.paid.2003.12.003

Wong, C.-S., & Law, K.S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly, 13*, 243–274.